Topics in Primary Care Medicine

Common Ectoparasites

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"Topics in Primary Care Medicine" presents articles on common diagnostic or therapeutic problems encountered in primary care practice. Physicians interested in contributing to the series are encouraged to contact the series' editors.

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The management of ectoparasite infestation is important in office practice to general medicine practitioners. There is currently a "pandemic" of scabies which is becoming more common among all age groups and socioeconomic classes. Scabies has become a venereal disease in sexually active adults as well as a nosocomial infection within hospitals. Pediculosis (lice) is an age-old problem, especially in times of warfare and in the presence of poor hygiene and sexual permissiveness. Furthermore, body lice have in the past transmitted such diseases as epidemic typhus *(Rickettsia prowazekii),* trench fever *(Rickettsia quintana)* and epidemic relapsing fever *(Borrelia recurrentis).*

Scabies

Parasite

Scabies is a skin infestation by the mite, *Sarcoptes scabiei* (Figure 1). The adult mite has four pairs of legs, two anterior and two posterior. The four front legs end in suckers and the rear legs end with long trailing bristles. Protruding from the front of the organism are mouth parts. The adult female is the most commonly found mite in scabies. It enters the human skin and burrows into the stratum corneum, residing just below its surface and laying two to three eggs per day during a lifetime of about 30 days. These eggs hatch giving rise to larvae which molt to produce nymphs. The nymph molts two more times before becoming an adult mite. This whole process takes approximately ten days. The young female copulates with a male mite, then enlarges and enters the stratum corneum.

Clinic Presentation and Diagnosis

Pruritus is the most common clinical manifestation in scabies, especially at night. Since scabies is an immunologic response to the organism, the symptoms and rash may develop over four to six weeks. The most frequent lesions are papulovesicular, though the classic finding is a burrow, produced by the mite burrowing within the stratum corneum. Frequently these lesions are excoriated and even impetiginized. The most common areas of involvement are hands, fingerwebs, flexor surfaces of the wrists, extensor areas of the elbows and knees, axillae, periumbilical area, breasts, genitalia (particularly the penis and scrotum) and buttocks (Figures 2 and 3). The mite rarely affects any area above the neck in adults. In bedridden patients, scabies may be limited to skin sites in direct contact with sheets. "Nodular scabies" is caused by a hypersensitivity reaction to the mite. These nodules can persist for months despite effective antiscabietic therapy. Nodules are most commonly seen in the crural area and axillae and on genitalia.

Crusted or keratotic scabies, formerly known as "Norwegian scabies," occurs in immunocompromised patients. These patients present with thick, hyperkeratotic areas on the palms, soles, elbows and knees, with involvement of head and neck areas as well. This form of scabies is highly contagious because of the large numbers of mites found on the skin. Crusted scabies is rare and may go undiagnosed for a prolonged period of time, allowing multiple contacts to become infested.

Scabies is usually transmitted by direct contact with infected persons. School children may introduce the

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disease into their own households. Scabies is probably spread infrequently by fomites because only a small number of mites are shed by a patient and mites do not survive longer than two to ten days without attaching to human skin.

Diagnosis

The diagnosis of scabies is made by both physical examination and identification of the mite. Because the lesions are pleomorphic and may be excoriated, eczematized and impetiginized, one must keep a high degree of suspicion. Differential diagnosis includes insect bites, impetigo, neurodermatitis, lichen simplex chronicus and dermatitis herpetiformis. The mite can be identified by shaving a lesion with either a #15 blade scalpel or a razor blade. The material is then placed on a slide under mineral oil or 10% or 20% potassium hydroxide solution, and a cover slip. The specimen is examined under a microscope for the mite, eggs or fecal pellets. A skin biopsy may be helpful in atypical cases or in lesions not diagnosed by skin scraping.

Treatment

The treatment of scabies is somewhat controversial. Most authorities advise the single application of 1% gamma benzene hexachloride (Kwell) lotion or cream.[2] Gamma benzene hexachloride is left on the skin for approximately 8 to 12 hours before it is washed off. Kwell should be applied thinly and evenly, and used on the neck and head only if there is evidence of scabies in these areas. This drug has been associated with central nervous system toxicity, but most cases have represented a misuse of the preparation. Absorption of 1% Kwell may, however, be increased in severe cases of scabies with widespread excoriation or secondary infection. In infants and pregnant women, some physicians prefer crotamiton (Eurax). This drug also has antipruritic properties but is less effective than Kwell and requires a second application 24 hours later. A preparation of 5% precipitated sulfur in petrolatum can also be used to treat young children; adults can be treated with the 10% concentrated sulfur.

It is wise to treat close contacts of an infected person, such as family members, even if they are asymptomatic. Patients should wash with hot water their bedding, towels and clothing worn over the past two days. It is usually not necessary to clean outer garments or furniture. The patient should be instructed that even though the mites and eggs are killed by therapy, itching and some lesions may persist for several days or even weeks.

Topical use of corticosteroids is necessary to treat

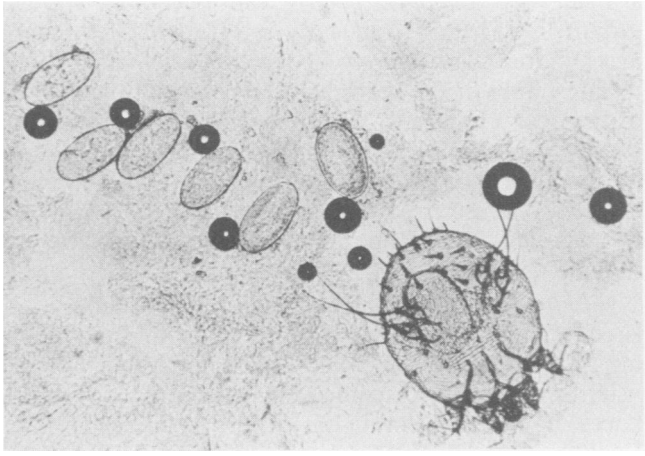

Figure 1.—Adult *Sarcoptes scabiei* (potassium hydroxide preparation).

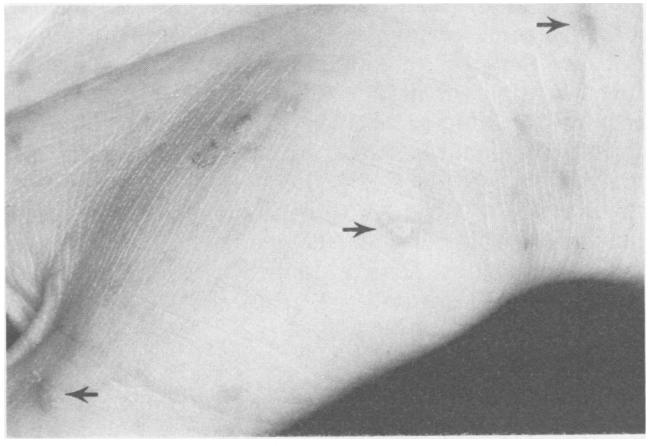

Figure 2.—Scabies on the hand.

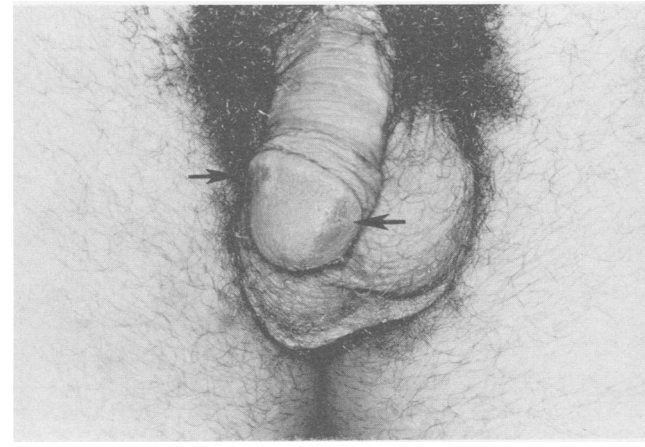

Figure 3.—Scabies on male genitalia.

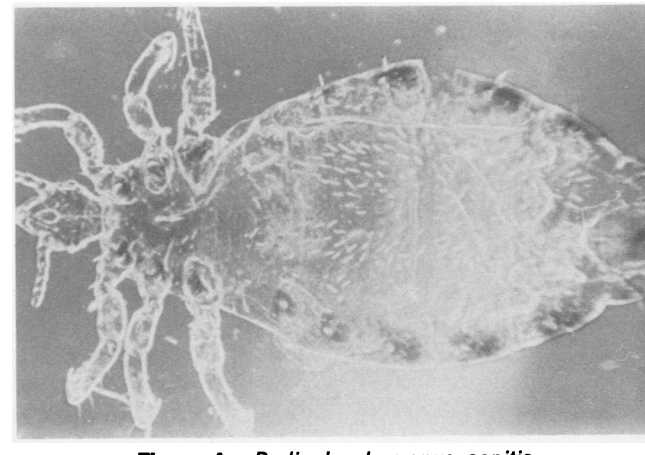

Figure 4.—*Pediculus humanus capitis.*

the pruritus. Secondary infections require treatment with systemic antibiotics. Scabietic nodules may not respond to topical steroids. Here intralesional or even systemic steroids may be helpful.

Pediculosis (Lice)

Parasite

Pediculosis is skin infestation by a 2- to 3-mm wingless flat-bodied insect with three pairs of lateral legs ending in "claws" (Figures 4 and 5). Three different varieties of lice may infest humans: *Pediculus humanus corporis* (body louse), *Pediculus humanus capitis* (head louse) and *Phthirus pubis* (pubic crab louse). The fertilized adult lays her eggs either on body hairs or fibers of clothing. These eggs are referred to as nits. After seven to ten days, small nymphs emerge from the eggs and molt three times before becoming adults. The female produces as many as 250 eggs during her life span which lasts approximately 30 to 35 days. Adult lice attach themselves to the skin, living on the blood they suck. On piercing the skin, they release saliva which is antigenic and causes pruritus and subsequent dermatitis.

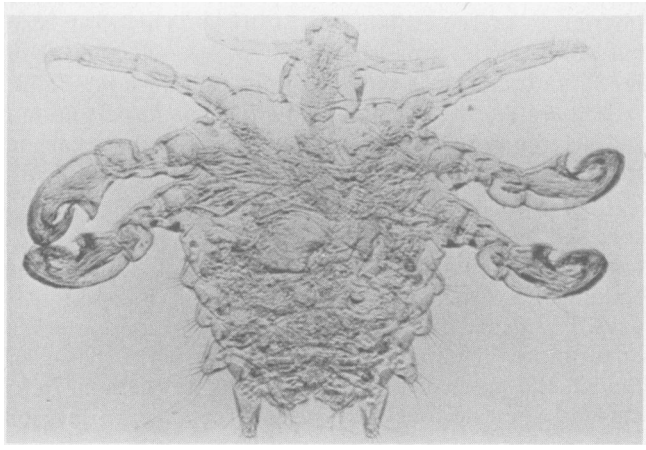

Figure 5.—*Phthirus pubis.*

Figure 6.—Pediculosis capitis.

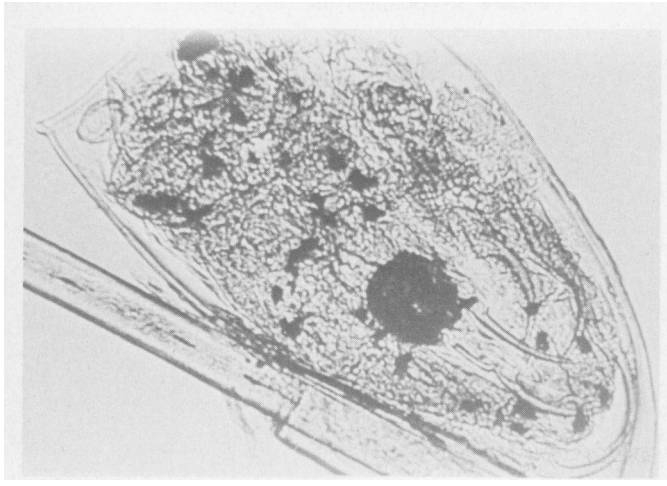

Figure 7.—Nit on hair.

Clinical Presentation

Infestation with *Pediculus humanis corporis* has also been called "vagabond's disease." It is most frequently seen in lower socioeconomic groups, associated with poor personal hygiene. The body louse lives mainly in seams of clothing and bedding. Very few are attached to human hairs and they are rarely found on the body during physical examination. The louse does descend to the skin for feeding. This subsequently causes generalized itching and papular or urticarial lesions. Secondary impetiginization may occur.

Pediculus humanus capitis can occur in all age groups, but is most frequently seen in younger school age children. This variety of louse usually limits itself to infestation of the scalp hairs, especially on the back of the neck (Figure 6). Pruritus is the major symptom leading to excoriation, secondary infection and lymphadenopathy. The pruritus and infection may be severe enough to cause irritability and restlessness. Diagnosis is made by identification of the parasite or the nit (Figure 7).

Phthirus pubis is most frequently found in adults and is contracted through sexual partners or infested clothing and bedding. The pubic crab louse usually limits itself to pubic hair extending from the umbilicus to the knees; however, it can migrate to the axillae and beard. Eyelash involvement is common in children who place their heads in the laps of infected adults. These lice can be difficult to find, but the nits usually can be seen attached to the hair shaft. Pruritus may be intense, although some persons are less bothered by the itching than by the sight of nits and lice. Occasionally, blue macules approximately 5 mm in diameter are seen on the lower abdomen and on the inner aspect of the thighs. These macules are called maculae caeruleae and are probably produced by alterated blood pigments at the site of the bites. As with pediculosis capitis, there may be excoriation with secondary infection and local lymphadenopathy. Extreme sensitivity to the bites may cause bullous lesions.

Treatment

The treatment for pediculosis is similar to that for scabies. For pediculosis pubis and pediculosis capitis, Kwell shampoo is extremely effective. The hair should

be thoroughly washed, rinsed, and the remaining nits combed out with a fine tooth comb. If a second application is needed, it should not be repeated for at least seven days. Crotamiton (Eurax), benzyl benzoate, malathion (Prioderm) and pyrethrin (Rid) can also be used. Pyrethrin is available without prescription. Sexual contacts of those with pediculosis pubis should also be treated. Eyelid involvement may be treated by the application of petrolatum twice a day for eight days, followed by the removal of any remaining nits.

Application of pediculicides for patients with body lice is usually not necessary. These patients need to wash or dry clean their clothes. Alternatively, the clothes can be placed in a plastic bag for seven to ten days, during which the lice will die. In body lice epidemics, DDT powder or benzene hexachloride (Lindane) can be dusted on clothing for the population at risk. As in scabies, secondary infection should be treated with systemic antibiotics. Eczematized areas may need topical or even systemic corticosteroids to clear the lesions.

Fleas

Parasite

Fleas are members of the insect order Siphonaptera, wingless 1- to 4-mm long blood-sucking ectoparasites of mammals and birds. Fleas take several blood meals a day, especially before laying eggs. A female flea lays her eggs on her host or in household crevices. Eggs hatch into larvae over a few days to weeks, depending on environmental conditions. Then larvae grow in cocoons to reach adulthood.

Clinical Presentation

Fleas are the vectors of plague and murine typhus. Flea bites most often occur on the legs and exposed areas of the body. These bites are usually erythematous and papular; in hypersensitive persons these lesions may become vesicular or even bullous. Flea bites are quite pruritic and secondary infection can become a problem. *Tunga penetrans* ("jigger flea," "chigoe") is commonly found in Latin America and Africa; this flea burrows below the stratum corneum of toes and fingernails and causes subcutaneous abscesses.

Treatment

Topical steroids and antihistamines are used to alleviate pruritus. Flea-infested rooms should be sprayed repeatedly to kill adult fleas emerging from cocoons. Flea-ridden domestic animals can be washed with insecticidal shampoo (malathion, for instance), dusted with DDT powder or fitted with a plastic "flea collar" impregnated with dichlorvos.

Ticks

Parasite

Ticks are eight-legged insects which are either soft bodied (Argasidae) or possess a hard, dorsal shell (Ixodidae). Argasidae live apart from the host in burrows or crevices, and emerge at night to bite and suck blood. The most common genus of soft ticks is *Ornithodoros,* vectors of relapsing fever *(Borrelia).* Ixodidae attach to the host during their complete life cycle (larvae, nymph, adult) and drop off the skin only when they become engorged with blood or die. There are 12 genera of hard ticks including *Dermacenter, Amblyomma, Ixodes* and *Rhipicephalus.*

Clinical Presentation

Usually the bite of a tick is painless, although occasionally a tick granuloma can occur. Hard ticks can cause tick paralysis, probably secondary to a neurotoxin in tick saliva. This paralysis may involve the pharynx, extremities, respiratory muscles and heart. Hard ticks can also transmit several diseases including viral encephalitis, tularemia, Rocky Mountain spotted fever, Q fever, Colorado tick fever, *Babesia* and erythema chronicum migrans (Lyme disease).

Treatment

Any patient with fever and possible tick exposure should be examined carefully for ticks and evidence of any of the previously mentioned transmissible diseases. Hard ticks can be removed by applying ether, acetone or benzene to the tick in order to loosen its mouth parts. Ticks also can be burned off or surgically excised. In regions with heavy infestation, protective clothing should be worn and areas such as the neck, scalp, wrists and ankles should be frequently inspected for ticks. Also tick repellents such as 30% N-butyl acetanilide can be used.

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